

SEQUENCE LISTING

<110> Ruben, Steven M.
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Gentz, Reiner L.

<120> Keratinocyte Growth Factor-2

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<170> PatentIn Ver. 2.1

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Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser
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gtc cct gtc acc tgc caa gcc ctt ggt cag gac atg gtg tca cca gag 144
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu
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Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly
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agg cat gtg cgg agc tac aat cac ctt caa gga gat gtc cgc tgg aga 240
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
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aag cta ttc tct ttc acc aag tac ttt ctc aag att gag aag aac ggg 288
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly
85 90 95

aag gtc agc ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag 336
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
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Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser

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130	135	140	
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Tyr Asn Thr Tyr Ala Ser	Phe Asn Trp Gln His Asn	Gly Arg Gln Met	
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 Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
 65 70 75 80
 Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly
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 Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
 100 105 110
 Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser
 115 120 125
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 130 135 140
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 145 150 155 160
 Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met

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35 40 45
Ser Leu Val Ala Leu Ser Leu Ala Arg Leu Pro Val Ala Ala Gln Pro
50 55 60
Lys Glu Ala Ala Val Gln Ser Gly Ala Gly Asp Tyr Leu Leu Gly Ile
65 70 75 80
Lys Arg Leu Arg Arg Leu Tyr Cys Asn Val Gly Ile Gly Phe His Leu
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Gln Ala Leu Pro Asp Gly Arg Ile Gly Gly Ala His Ala Asp Thr Arg
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Asp Ser Leu Leu Glu Leu Ser Pro Val Glu Arg Gly Val Val Ser Ile
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35 40 45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
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Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
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Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
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130 135 140
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Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
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Tyr Cys Ala Thr Lys Tyr His Leu Gln Leu His Pro Ser Gly Arg Val
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Val Glu Val Gly Ile Val Ala Ile Arg Gly Leu Phe Ser Gly Arg Tyr
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Ala Glu Cys Glu Phe Val Glu Arg Ile His Glu Leu Gly Tyr Asn Thr
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 Arg Pro Phe Gly Gln Arg Ser Arg Ala Gly Lys Asn Phe Thr Asn Pro
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 Ala Pro Asn Tyr Pro Glu Glu Gly Ser Lys Glu Gln Arg Asp Ser Val
 65 70 75 80
 Leu Pro Lys Val Thr Gln Arg His Val Arg Glu Gln Ser Leu Val Thr
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 Asp Gln Leu Ser Arg Arg Leu Ile Arg Thr Tyr Gln Leu Tyr Ser Arg
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aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga tac aat 1078
 Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
 150 155 160

acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg tat gtg 1126
 Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
 165 170 175

gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca cga agg 1174
 Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
 180 185 190

aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca 1216
 Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
 195 200 205

tagaggaagg caccgtttgt ggatgcagta aaaccaatgg ctcttttgcc aagaatagtg 1276
 gatattcttc atgaagacag tagattgaaa ggcaaagaca cgttgcagat gtctgcttgc 1336
 ttaaaagaaa gccagccttt gaagggtttt gtattcactg ctgacatatg atgttctttt 1396
 aattagttct gtgtcatgtc ttataatcaa gatataggca gatcgaatgg gatagaagtt 1456
 attcccaagt gaaaaacatt gtggctgggt tttttgttgt tgttgtcaag tttttgtttt 1516
 taaacctctg agatagaact taaaggacat agaacaatct gttgaaagaa cgatcttcgg 1576
 gaaagttatt tatggaatac gaactcatat caaagacttc attgctcatt caagcctaata 1636
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 gcacaaccaa aggagttctg gatgtggtct catggaataa ttgaatagaa tttaaaaata 1756
 taaacatggt agtgtgaaac tgttctaaca atacaaatag tatggtatgc ttgtgcattc 1816
 tgccttcac cctttctatt tctttctaag ttattttatt aataggatgt taaatatctt 1876
 ttgggggttt aaagagtatc tcagcagctg tcttctgatt tatcttttct ttttattcag 1936
 cacaccacat gcatgttcac gacaaagtgt ttttaaaact tggcgaacac ttcaaaaata 1996
 ggagttggga ttagggaagc agtatgagtg cccgtgtgct atcagttgac ttaatttgca 2056
 cttctgcagt aataaccatc aacaataaat atggcaatgc tgtgccatgg cttgagtgag 2116
 agatgtctgc tatcatttga aaacatatat tactctcgag gcttctctgc tcaagaaata 2176
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tgtgagctat aatgtaatgc attcctatcc aaactaggtt tctttttttc ctttatgttg 3256
aaataataat ggcacctgac acatagacat agaccacca caacctaat taaatgtttg 3316
gtaagacaaa tacacattgg atgaccacag taacagcaaa cagggcacia actggattct 3376
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tactcaagac actaaaacag cttctagcca aatataataa agcttgcaga ggccaaaaat 3496
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ggaagcaagg aaagaaggaa ggaaggaaag aaggaggga aggaaggaga gagaaagaaa 3976
gattgtttgg taaggagtaa tgacattctc ttgcatttaa aagtggcata tttgcttgaa 4036
atggaaatag aattctgggc ctttttgcaa ctactgaaga aaaaaaaaaa cagtttcagc 4096
cctgaatgtt gtagatttga aaaaaaaaaa aaaaaaactc gagggggggc ccgtacccaa 4156
ttcgccctat agtgagtcgt a 4177

<210> 24

<211> 208

<212> PRT

<213> Homo sapiens

<400> 24

Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu

1	5	10	15
Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser	20	25	30
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu	35	40	45
Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly	50	55	60
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg	65	70	75
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly	85	90	95
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu	100	105	110
Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser	115	120	125
Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys	130	135	140
Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly	145	150	155
Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met	165	170	175
Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr	180	185	190
Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser	195	200	205

<210> 25
 <211> 31
 <212> PRT
 <213> Homo sapiens

<400> 25
 Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser Ser Ser Ser
 1 5 10 15
 Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser Tyr Asn
 20 25 30

<210> 26
 <211> 19
 <212> PRT
 <213> Homo sapiens

<400> 26
 Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys
 1 5 10 15

Pro Tyr Ser

<210> 27
 <211> 30
 <212> PRT
 <213> Homo sapiens

<400> 27
 Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys
 1 5 10 15
 Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr
 20 25 30

<210> 28
 <211> 19
 <212> PRT
 <213> Homo sapiens

<400> 28
 Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn
 1 5 10 15

Thr Ser Ala

<210> 29
 <211> 555
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> CDS
 <222> (1)..(552)

<220>
 <223> Description of Artificial Sequence: pQE60-Cys37
 construct

<400> 29
 atg aga gga tgc cat cac cat cac cat cac gga tcc tgc cag gct ctg 48
 Met Arg Gly Ser His His His His His His Gly Ser Cys Gln Ala Leu
 1 5 10 15
 ggt cag gac atg gtt tct ccg gaa gct acc aac tct tcc tct tcc tct 96
 Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser Ser Ser Ser
 20 25 30
 ttc tct tcc ccg tct tcc gct ggt cgt cac gtt cgt tct tac aac cac 144
 Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser Tyr Asn His
 35 40 45
 ctg cag ggt gac gtt cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac 192
 Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr
 50 55 60
 ttc ctg aaa atc gaa aaa aac ggt aaa gtt tct ggg acc aag aag gag 240
 Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu

65	70								75				80					
aac tgc ccg tac agc atc ctg gag ata aca tca gta gaa atc gga gtt	288																	
Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val																		
	85								90				95					
gtt gcc gtc aaa gcc att aac agc aac tat tac tta gcc atg aac aag	336																	
Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys																		
	100								105				110					
aag ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg	384																	
Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu																		
	115								120				125					
aag gag agg ata gag gaa aat gga tac aat acc tat gca tca ttt aac	432																	
Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn																		
	130								135				140					
tgg cag cat aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga	480																	
Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly																		
	145								150				155				160	
gct cca agg aga gga cag aaa aca cga agg aaa aac acc tct gct cac	528																	
Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His																		
	165								170				175					
ttt ctt cca atg gtg gta cac tca tag	555																	
Phe Leu Pro Met Val Val His Ser																		
	180																	

<210> 30

<211> 184

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: pQE60-Cys37 construct

<400> 30

Met Arg Gly Ser His His His His His His Gly Ser Cys Gln Ala Leu
1 5 10 15

Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser Ser Ser Ser

Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser Tyr Asn His
35 40 45

Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr
50 55 60

Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu
65 70 75 80

Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val
85 90 95

Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	Tyr	Leu	Ala	Met	Asn	Lys
			100					105					110		

Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
115 120 125

Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
 130 135 140

Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
 145 150 155 160

Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
 165 170 175

Phe Leu Pro Met Val Val His Ser
 180

<210> 31
 <211> 84
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 primer

<400> 31
 atgtggaaat ggatactgac ccactgcgct tctgctttcc cgcacctgcc gggttgctgc 60
 tgctgctgct tctgctgct gttc 84

<210> 32
 <211> 82
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 primer

<400> 32
 ccggagaaac catgtcctga cccagagcct ggcaggtaac cggaacagaa gaaaccagga 60
 acagcagcag gaagcagcag ca 82

<210> 33
 <211> 80
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 primer

<400> 33
 gggtcaggac atggtttctc cggaagctac caactcttct tcttcttctt tctcttctcc 60
 gtcttctgct ggtcgtcacg 80

<210> 34
 <211> 81
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
primer

<400> 34
ggtgaaagag aacagtttac gccaacgaac gtcaccctgc aggtggttgt aagaacgaac 60
gtgacgacca gcagaagacg g 81

<210> 35
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 35
cgttggcgta aactgttctc ttccacaaa tacttctga aaatcgaaaa aaacggtaaa 60
gtttctggga ccaa 75

<210> 36
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 36
tttggtccca gaaactttac cgtttttttc gattttcag 39

<210> 37
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 37
aaaggatcca tgtggaaatg gatactgacc cactgc 36

<210> 38
<211> 627
<212> DNA
<213> Escherichia coli

<220>
<221> CDS
<222> (1)..(627)

<400> 38
atg tgg aaa tgg ata ctg acc cac tgc gct tct gct ttc ccg cac ctg 48
Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
1 5 10 15

ccg ggt tgc tgc tgc tgc tgc ttc ctg ctg ctg ttc ctg gtt tct tct	96
Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser	
20 25 30	
gtt ccg gtt acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa	144
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu	
35 40 45	
gct acc aac tct tcc tct tcc tct ttc tct tcc ccg act tcc gct ggt	192
Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Thr Ser Ala Gly	
50 55 60	
cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt	240
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg	
65 70 75 80	
aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt	288
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly	
85 90 95	
aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag	336
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu	
100 105 110	
ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc	384
Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser	
115 120 125	
aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa	432
Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys	
130 135 140	
gaa ttt aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga	480
Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly	
145 150 155 160	
tac aat acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg	528
Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met	
165 170 175	
tat gtg gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca	576
Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr	
180 185 190	
cga agg aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca	624
Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser	
195 200 205	
tag	627

<210> 39
 <211> 208
 <212> PRT
 <213> Escherichia coli

<400> 39
 Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
 1 5 10 15
 Pro Gly Cys Cys Cys Cys Phe Leu Leu Phe Leu Val Ser Ser
 20 25 30

Val	Pro	Val	Thr	Cys	Gln	Ala	Leu	Gly	Gln	Asp	Met	Val	Ser	Pro	Glu
		35					40					45			
Ala	Thr	Asn	Ser	Ser	Ser	Ser	Ser	Phe	Ser	Ser	Pro	Thr	Ser	Ala	Gly
	50					55				60					
Arg	His	Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg
65					70				75					80	
Lys	Leu	Phe	Ser	Phe	Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly
				85					90					95	
Lys	Val	Ser	Gly	Thr	Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu
			100					105					110		
Ile	Thr	Ser	Val	Glu	Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser
	115						120					125			
Asn	Tyr	Tyr	Leu	Ala	Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys
	130					135					140				
Glu	Phe	Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly
145					150				155					160	
Tyr	Asn	Thr	Tyr	Ala	Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met
				165					170					175	
Tyr	Val	Ala	Leu	Asn	Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr
			180					185					190		
Arg	Arg	Lys	Asn	Thr	Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser
		195					200					205			

<210> 40
 <211> 38
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 40
 ttctcatgact tgtcaagctc tgggtcaaga tatggttc

38

<210> 41
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 41
 gcccaagctt ccacaaacgt tgccttcc

28

<210> 42
 <211> 525
 <212> DNA
 <213> Escherichia coli

<220>
 <221> CDS
 <222> (1)..(522)

<400> 42
 atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc
 Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
 1 5 10 15

48

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aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac    96
Asn Ser Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
                20                      25                      30

ggt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg    144
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
                35                      40                      45

ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt    192
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
                50                      55                      60

tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca    240
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
                65                      70                      75                      80

tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat    288
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
                85                      90                      95

tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt    336
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
                100                      105                      110

aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga tac aat    384
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
                115                      120                      125

acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg tat gtg    432
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
                130                      135                      140

gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca cga agg    480
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
                145                      150                      155                      160

aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca tag    525
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
                165                      170

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<210> 43
 <211> 174
 <212> PRT
 <213> Escherichia coli

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<400> 43
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
  1                5                10                15

Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
                20                      25                      30

Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
                35                      40                      45

Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
                50                      55                      60

Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
                65                      70                      75                      80

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Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
85 90 95
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
100 105 110
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
115 120 125
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
130 135 140
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
145 150 155 160
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
165 170

<210> 44
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 44
tcagtgaatt cattaaagag gagaaattaa tcatgacttg ccagg 45

<210> 45
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 45
tcatgacttg ccaggcactg ggtcaagaca tggtttcccc ggaagcta 48

<210> 46
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 46
gcttcagcag cccatctagc gcaggtcgctc acgttcgctc ttacaacc 48

<210> 47
<211> 48
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic primer

<400> 47

gttcggtggc gcaaactggt cagctttacc aagtacttcc tgaaaatc

48

<210> 48

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic primer

<400> 48

tcgaaaaaaaa cggtaaagtt tctgggac

28

<210> 49

<211> 48

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic primer

<400> 49

gatgggctgc tgaagctaga gctggagctg ttggtagctt ccggggaa

48

<210> 50

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic primer

<400> 50

aacagtttgc gccaacgaac atcacoctgt aagtggttgt aagag

45

<210> 51

<211> 47

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic primer

<400> 51

ttcttgggcc cagaaacttt accgtttttt tcgattttca ggaagta

47

<210> 52
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 primer

<400> 52
 ttcttggtcc cagaaacttt accg 24

<210> 53
 <211> 45
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 primer

<400> 53
 agatcaggct tctattatta tgagtgtacc accattggaa gaaag 45

<210> 54
 <211> 525
 <212> DNA
 <213> Escherichia coli

<220>
 <221> CDS
 <222> (1)..(522)

<400> 54
 atg act tgc cag gca ctg ggt caa gac atg gtt tcc ccg gaa gct acc 48
 Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
 1 5 10 15

aac agc tcc agc tct agc ttc agc agc cca tct agc gca ggt cgt cac 96
 Asn Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
 20 25 30

gtt cgc tct tac aac cac tta cag ggt gat gtt cgt tgg cgc aaa ctg 144
 Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
 35 40 45

ttc agc ttt acc aag tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt 192
 Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
 50 55 60

tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca 240
 Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
 65 70 75 80

tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat 288
 Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
 85 90 95

tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt 336
 Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe

100										105					110					
aac	aat	gac	tgt	aag	ctg	aag	gag	agg	ata	gag	gaa	aat	gga	tac	aat	384				
Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn					
		115					120					125								
acc	tat	gca	tca	ttt	aac	tgg	cag	cat	aat	ggg	agg	caa	atg	tat	gtg	432				
Thr	Tyr	Ala	Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val					
	130					135					140									
gca	ttg	aat	gga	aaa	gga	gct	cca	agg	aga	gga	cag	aaa	aca	cga	agg	480				
Ala	Leu	Asn	Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg					
145					150					155					160					
aaa	aac	acc	tct	gct	cac	ttt	ctt	cca	atg	gtg	gta	cac	tca	tag		525				
Lys	Asn	Thr	Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser							
				165					170											

<210> 55
 <211> 174
 <212> PRT
 <213> Escherichia coli

<400> 55
 Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
 1 5 10 15
 Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
 20 25 30
 Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
 35 40 45
 Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
 50 55 60
 Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
 65 70 75 80
 Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
 85 90 95
 Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
 100 105 110
 Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
 115 120 125
 Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
 130 135 140
 Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
 145 150 155 160
 Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
 165 170

<210> 56
 <211> 35

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 56
ggaccctcat gacctgccag gctctggggtc aggac 35

<210> 57
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 57
ggacagccat ggctggtcgt cacgttcg 28

<210> 58
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 58
ggacagccat gggttcgttg cgtaaactg 29

<210> 59
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 59
ggacagccat ggaaaaaac ggtaaagttt c 31

<210> 60
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 60
ggaccccat ggagaactgc ccgtagagc 29

<210> 61
<211> 32
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 61

ggacccccat ggtcaaagcc attaacagca ac 32

<210> 62

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 62

ggacccccat ggggaaactc tatggctcaa aag 33

<210> 63

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 63

ctgcccaagc ttattatgag tgtaccacca ttggaag 37

<210> 64

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 64

ctgcccaagc ttattacttc agcttacagt cattgt 36

<210> 65

<211> 525

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(522)

<400> 65

atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc 48
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
1 5 10 15

aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac 96
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
20 25 30

ggt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg 144

Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg	Lys	Leu		
		35					40					45					
ttc	tct	ttc	acc	aaa	tac	ttc	ctg	aaa	atc	gaa	aaa	aac	ggt	aaa	gtt	192	
Phe	Ser	Phe	Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly	Lys	Val		
	50					55					60						
tct	ggg	acc	aag	aag	gag	aac	tgc	ccg	tac	agc	atc	ctg	gag	ata	aca	240	
Ser	Gly	Thr	Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr		
	65				70				75						80		
tca	gta	gaa	atc	gga	gtt	gtt	gcc	gtc	aaa	gcc	att	aac	agc	aac	tat	288	
Ser	Val	Glu	Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr		
				85					90						95		
tac	tta	gcc	atg	aac	aag	aag	ggg	aaa	ctc	tat	ggc	tca	aaa	gaa	ttt	336	
Tyr	Leu	Ala	Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe		
			100				105						110				
aac	aat	gac	tgt	aag	ctg	aag	gag	agg	ata	gag	gaa	aat	gga	tac	aat	384	
Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn		
		115					120					125					
acc	tat	gca	tca	ttt	aac	tgg	cag	cat	aat	ggg	agg	caa	atg	tat	gtg	432	
Thr	Tyr	Ala	Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val		
	130					135					140						
gca	ttg	aat	gga	aaa	gga	gct	cca	agg	aga	gga	cag	aaa	aca	cga	agg	480	
Ala	Leu	Asn	Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg		
	145				150					155					160		
aaa	aac	acc	tct	gct	cac	ttt	ctt	cca	atg	gtg	gta	cac	tca	tag		525	
Lys	Asn	Thr	Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser				
				165					170								

<210> 66
 <211> 174
 <212> PRT
 <213> Homo sapiens

<400> 66
 Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
 1 5 10 15
 Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
 20 25 30
 Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
 35 40 45
 Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
 50 55 60
 Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
 65 70 75 80
 Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
 85 90 95
 Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
 100 105 110

Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
 115 120 125
 Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
 130 135 140
 Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
 145 150 155 160
 Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
 165 170

<210> 67
 <211> 444
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(444)

<400> 67
 atg gct ggt cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt 48
 Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
 1 5 10 15
 cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa 96
 Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
 20 25 30
 aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc 144
 Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
 35 40 45
 atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc 192
 Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
 50 55 60
 att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat 240
 Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
 65 70 75 80
 ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag gag agg ata gag 288
 Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu
 85 90 95
 gaa aat gga tac aat acc tat gca tca ttt aac tgg cag cat aat ggg 336
 Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly
 100 105 110
 agg caa atg tat gtg gca ttg aat gga aaa gga gct cca agg aga gga 384
 Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly
 115 120 125
 cag aaa aca cga agg aaa aac acc tct gct cac ttt ctt cca atg gtg 432
 Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val
 130 135 140
 gta cac tca tag 444
 Val His Ser

145

<210> 68
 <211> 147
 <212> PRT
 <213> Homo sapiens

<400> 68
 Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
 1 5 10 15
 Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
 20 25 30
 Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
 35 40 45
 Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
 50 55 60
 Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
 65 70 75 80
 Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu
 85 90 95
 Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly
 100 105 110
 Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly
 115 120 125
 Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val
 130 135 140
 Val His Ser
 145

<210> 69
 <211> 402
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(402)

<400> 69
 atg gtt cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa 48
 Met Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys
 1 5 10 15
 atc gaa aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg 96
 Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
 20 25 30
 tac agc atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc 144
 Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
 35 40 45
 aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa 192
 Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
 50 55 60
 ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag gag agg 240
 Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
 65 70 75 80

ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg cag cat 288
 Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
 85 90 95

aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct cca agg 336
 Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
 100 105 110

aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt ctt cca 384
 Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro
 115 120 125

atg gtg gta cac tca tag 402
 Met Val Val His Ser
 130

<210> 70
 <211> 133
 <212> PRT
 <213> Homo sapiens

<400> 70
 Met Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys
 1 5 10 15
 Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
 20 25 30
 Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
 35 40 45
 Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
 50 55 60
 Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
 65 70 75 80
 Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
 85 90 95
 Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
 100 105 110
 Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro
 115 120 125
 Met Val Val His Ser
 130

<210> 71
 <211> 354
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(354)

<400> 71
 atg gaa aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg 48
 Met Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
 1 5 10 15

tac agc atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc 96
 Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
 20 25 30

aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa 144
Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
35 40 45

ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag gag agg 192
Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
50 55 60

ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg cag cat 240
Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
65 70 75 80

aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct cca agg 288
Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
85 90 95

aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt ctt cca 336
Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro
100 105 110

atg gtg gta cac tca tag 354
Met Val Val His Ser
115

<210> 72
<211> 117
<212> PRT
<213> Homo sapiens

<400> 72
Met Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
1 5 10 15
Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
20 25 30
Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
35 40 45
Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
50 55 60
Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
65 70 75 80
Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
85 90 95
Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro
100 105 110
Met Val Val His Ser
115

<210> 73
<211> 321
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(321)

<400> 73
atg gag aac tgc ccg tac agc atc ctg gag ata aca tca gta gaa atc 48
Met Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile

1	5	10	15	
gga gtt gtt gcc gtc aaa gcc att aac agc aac tat tac tta gcc atg				96
Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met	20	25	30	
aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt				144
Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys	35	40	45	
aag ctg aag gag agg ata gag gaa aat gga tac aat acc tat gca tca				192
Lys Leu Lys Gly Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser	50	55	60	
ttt aac tgg cag cat aat ggg agg caa atg tat gtg gca ttg aat gga				240
Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly	65	70	75	80
aaa gga gct cca agg aga gga cag aaa aca cga agg aaa aac acc tct				288
Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser	85	90	95	
gct cac ttt ctt cca atg gtg gta cac tca tag				321
Ala His Phe Leu Pro Met Val Val His Ser	100	105		

<210> 74
 <211> 106
 <212> PRT
 <213> Homo sapiens

<400> 74
 Met Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile
 1 5 10 15
 Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met
 20 25 30
 Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys
 35 40 45
 Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser
 50 55 60
 Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly
 65 70 75 80
 Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser
 85 90 95
 Ala His Phe Leu Pro Met Val Val His Ser
 100 105

<210> 75
 <211> 264
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(261)

<400> 75
 atg gtc aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag 48
 Met Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys

1	5	10	15	
ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag				96
Gly Lys Leu Tyr	Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys			
20	25	30		
gag agg ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg				144
Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp				
35	40	45		
cag cat aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct				192
Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala				
50	55	60		
cca agg aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt				240
Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe				
65	70	75	80	
ctt cca atg gtg gta cac tca tag				264
Leu Pro Met Val Val His Ser				
	85			

<210> 76
 <211> 87
 <212> PRT
 <213> Homo sapiens

<400> 76
 Met Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys
 1 5 10 15
 Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
 20 25 30
 Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp
 35 40 45
 Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala
 50 55 60
 Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe
 65 70 75 80
 Leu Pro Met Val Val His Ser
 85

<210> 77
 <211> 219
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(219)

<400> 77
 atg ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg 48
 Met Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
 1 5 10 15

aag gag agg ata gag gaa aat gga tac aat acc tat gca tca ttt aac 96
 Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
 20 25 30

tgg cag cat aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga 144
 Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
 35 40 45

gct cca agg aga gga cag aaa aca cga agg aaa aac acc tct gct cac 192
 Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
 50 55 60

ttt ctt cca atg gtg gta cac tca tag 219
 Phe Leu Pro Met Val Val His Ser
 65 70

<210> 78
 <211> 72
 <212> PRT
 <213> Homo sapiens

<400> 78
 Met Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
 1 5 10 15
 Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
 20 25 30
 Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
 35 40 45
 Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
 50 55 60
 Phe Leu Pro Met Val Val His Ser
 65 70

<210> 79
 <211> 357
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(357)

<400> 79
 atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc 48
 Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
 1 5 10 15

aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac 96
 Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
 20 25 30

gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg 144
 Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
 35 40 45

ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt 192
 Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
 50 55 60

tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca 240
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
65 70 75 80

tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat 288
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
85 90 95

tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt 336
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
100 105 110

aac aat gac tgt aag ctg aag 357
Asn Asn Asp Cys Lys Leu Lys
115

<210> 80
<211> 119
<212> PRT
<213> Homo sapiens

<400> 80
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
1 5 10 15

Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
20 25 30

Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
35 40 45

Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
50 55 60

Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
65 70 75 80

Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
85 90 95

Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
100 105 110

Asn Asn Asp Cys Lys Leu Lys
115

<210> 81
<211> 276
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(276)

<400> 81
atg gct ggt cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt 48
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
1 5 10 15

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cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa 96
Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
      20                25                30

aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc 144
Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
      35                40                45

atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc 192
Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
      50                55                60

att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat 240
Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
      65                70                75                80

ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag 276
Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
      85                90

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<210> 82
 <211> 92
 <212> PRT
 <213> Homo sapiens

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<400> 82
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
  1                5                10                15

Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
      20                25                30

Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
      35                40                45

Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
      50                55                60

Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
      65                70                75                80

Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
      85                90

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<210> 83
 <211> 525
 <212> DNA
 <213> Homo sapiens

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<400> 83
atgacctctc aggcctctggg tcaggacatg gtttctccgg aagctaccaa ctcttctct 60
tcctctttct cttccccgtc ttccgctggt cgtcacgttc gttcttacia ccacctgcag 120
ggtgacgttc gttggcgtaa actgttctct ttcaccaaact acttctgaa aatcgaaaaa 180
aacggtaaaag tttctgggac caagaaggag aactctccgt acagcatcct ggagataaca 240
tcagtagaaa tcggagttgt tgccgtcaaaa gccattaaca gcaactatta cttagccatg 300
aacaagaagg ggaaactcta tggctcaaaa gaatttaaca atgactgtaa gctgaaggag 360
aggatagagg aaaatggata caatacctat gcatcattta actggcagca taatgggagg 420
caaatgtatg tggcattgaa tggaaaagga gctccaagga gaggacagaa aacacgaagg 480
aaaaacacct ctgctcactt tcttccaatg gtggtacact catag 525

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<210> 84
<211> 525
<212> DNA
<213> Homo sapiens

<400> 84
atgacctgcc aggcctctggg tcaggacatg gtttctccgg aagctaccaa ctcttcctct 60
tcctctttct cttccccgtc ttccgctggt cgtcacgttc gttcttacia ccacctgcag 120
ggtgacgttc gttggcgtaa actgttctct ttcaccaaact acttcctgaa aatcgaaaaa 180
aacggtaaaag tttctgggac caagaaggag aactctccgt acagcatcct ggagataaca 240
tcagtagaaa tcggagtgtg tgccgtcaaa gccattaaca gcaactatta cttagccatg 300
aacaagaagg ggaaactcta tggctcaaaa gaatttaaca atgactgtaa gctgaaggag 360
aggatagagg aaaatggata caatacctat gcatcattta actggcagca taatgggagg 420
caaattgtatg tggcattgaa tggaaaagga gctccaagga gaggacagaa aacacgaagg 480
aaaaacacct ctgctcactt tcttccaatg gtggtacact catag 525

<210> 85
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 85
ggacctcat gacctctcag gctctgggt 29

<210> 86
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 86
aaggagaact ctccgtacag c 21

<210> 87
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 87
gctgtacggt ctgttctcct t 21

<210> 88
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 88
ggaccctcat gacctgccag gctctgggtc aggac 35

<210> 89
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 89
ctgccaagc ttattatgag tgtaccacca ttggaag 37

<210> 90
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 90
aaagatcct gccaggctct gggtcaggac atg 33

<210> 91
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 91
gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 92
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 92
gggccaagc ttatgagtgt accaccat 28

<210> 93
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 93
ccggcggatc ccatatgtct tacaaccacc tgcagg 36

<210> 94
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 94
ccggcggtac cttattatga gtgtaccacc attgg 35

<210> 95
<211> 426
<212> DNA
<213> Homo sapiens

<400> 95
atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcatacatt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggaaaagg agtccaagg 360
agaggacaga aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcataa 426

<210> 96
<211> 141
<212> PRT
<213> Homo sapiens

<400> 96
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15
Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30
Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45
Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 97
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 97
caaccacctg cagggtgacg 20

<210> 98
<211> 78
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 98
aacggtcgac aaatgtatgt ggcactgaac ggtaaagggtg ctccacgtcg tggtcagaaa 60
acccgtcgtg aaaacacc 78

<210> 99
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 99
gggcccaagc ttaagagtgt accaccattg gcagaaagtg agcagaggtg tttttacgac 60
gggttttctg accacg 76

<210> 100
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 100
gccacataca tttgtcgacc gtt 23

<210> 101
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 101
gggccaagc ttaagagtg 19

<210> 102
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 102
gccacataca ttgtcgacc gtt 23

<210> 103
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 103
ctgcagggtg acgttcgttg gcgtaaaactg ttctccttca ccaaatactt cctgaaaatc 60
gaaaaaaacg gtaaagtttc tggtagcaag 90

<210> 104
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 104
agctttaaca gcaacaacac cgatttcaac ggaggtgatt tccaggatgg agtacgggca 60
gttttctttc ttggtaccag aaactttacc 90

<210> 105
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 105
ggtgttggtg ctgttaaagc tatcaactcc aactactacc tggctatgaa caagaaagg 60
aaactgtacg gttccaaaga atttaacaac 90

<210> 106
<211> 100
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 106

gtcgaccgtt gtgctgccag ttgaaggaag cgtaggtgtt gtaaccgttt tcttcgatac 60
gttctttcag ttacagtcg ttgttaaatt ctttgaacc 100

<210> 107

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 107

gcggcgctga ccgttgtgct gccag 25

<210> 108

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 108

gcggcctgca ggtgacgtt cggttg 26

<210> 109

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 109

ccggcggatc ccatatgtct tacaaccacc tgcagg 36

<210> 110

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 110

cgcgcatat cttattaaga gtgtaccacc attg 34

<210> 111
<211> 426
<212> DNA
<213> Homo sapiens

<400> 111
atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc cttcaccaaa 60
tacttctctga aaatcgaaaa aaacggtaaa gtttctggta ccaagaaaga aaactgcccg 120
tactccatcc tggaaatcac ctccgttgaa atcgggtgtt ttgctgttaa agctatcaac 180
tccaactact acctggctat gaacaagaaa ggtaaactgt acggttccaa agaatttaac 240
aacgactgta aactgaaaga acgtatcgaa gaaaacgggtt acaacaccta cgcttccttc 300
aactggcagc acaacggtcg acaaattgtat gtggcactga acggtaaagg tgctccacgt 360
cgtgggtcaga aaaccgcgcg taaaaacacc tctgctcact ttctgccaat ggtggtacac 420
tcttaa 426

<210> 112
<211> 141
<212> PRT
<213> Homo sapiens

<400> 112
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15
Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30
Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45
Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 113
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 113
cgcgcccatg gctctgggtc aggacatg

<210> 114
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 114
gggcccaagc ttatgagtgt accaccat

28

<210> 115
<211> 516
<212> DNA
<213> Homo sapiens

<400> 115
atggctctgg gtcaagatat gggtttctccg gaagctacca actcttctctc ttcctcttttc 60
tcttccccgt cttccgctgg tcgtcacgtt cgttcttaca accacctgca ggggtgacgtt 120
cgttggcgta aactgttctc tttcaccaaa tacttctctga aaatcgaaaa aaacggtaaa 180
gtttctggga ccaagaagga gaactgcccg tacagcatcc tggagataac atcagtagaa 240
atcggagttg ttgccgtcaa agccattaac agcaactatt acttagccat gaacaagaa 300
gggaaactct atggctcaaa agaatttaac aatgactgta agctgaagga gaggatagag 360
gaaaatggat acaataccta tgcatacatt aactggcagc ataatgggag gcaaattgtat 420
gtggcattga atggaaaagg agctccaagg agaggacaga aaacacgaag gaaaaacacc 480
tctgctcact ttcttccaat ggtggtacac tcataa 516

<210> 116
<211> 171
<212> PRT
<213> Homo sapiens

<400> 116
Met Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser
1 5 10 15
Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser
20 25 30
Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser Phe
35 40 45
Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr
50 55 60
Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu
65 70 75 80
Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala
85 90 95
Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp
100 105 110
Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala
115 120 125
Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn
130 135 140

Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr
145 150 155 160

Ser Ala His Phe Leu Pro Met Val Val His Ser
165 170

<210> 117
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 117
gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 118
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 118
ctgcccgaagc ttttatgagt gtaccacccat tggaagaaag tgagcagagg tgtttttttc 60
tcgtgttttc tgtcc 75

<210> 119
<211> 426
<212> DNA
<213> Homo sapiens

<400> 119
atgtctttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttccctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
agaggacaga aaacacgaga aaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 120
<211> 141
<212> PRT
<213> Homo sapiens

<400> 120
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110

Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Glu Lys
115 120 125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 121
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 121
gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 122
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 122
ctgcccaagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttctg 60
tcgtgttttc tgtcc 75

<210> 123
<211> 426
<212> DNA
<213> Homo sapiens

<400> 123
atgtcttaca accacctgca gggtagcgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
agaggacaga aaacacgaca gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 124
<211> 141

<212> PRT

<213> Homo sapiens

<400> 124

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Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
  1          5          10          15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
          20          25          30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
          35          40          45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
          50          55          60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
          65          70          75          80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
          85          90          95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
          100          105          110

Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Gln Lys
          115          120          125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
          130          135          140

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<210> 125

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 125

gcggcacatg tcttacaacc acctgcaggg tg

32

<210> 126

<211> 84

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 126

ctgcccgaagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttcc 60
 tctgttttcc tgcctctcc ttgg 84

<210> 127

<211> 426

<212> DNA

<213> Homo sapiens

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<400> 127
atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttctctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggaaaagg agctccaagg 360
agaggacagg aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426
```

```
<210> 128
<211> 141
<212> PRT
<213> Homo sapiens
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<400> 128
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
  1              5              10              15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
      20              25              30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
      35              40              45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
      50              55              60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
      65              70              75              80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
      85              90              95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
      100              105              110

Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Glu Thr Arg Arg Lys
      115              120              125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
      130              135              140
```

```
<210> 129
<211> 32
<212> DNA
<213> Artificial Sequence
```

```
<220>
<223> Description of Artificial Sequence: primer
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```
<400> 129
gcggcacatg tcttacaacc acctgcaggg tg 32
```

```
<210> 130
<211> 84
<212> DNA
<213> Artificial Sequence
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<220>

<223> Description of Artificial Sequence: primer

<400> 130

ctgccaagc ttttatgagt gtaccacccat tggaagaaag tgagcagagg tgtttttcct 60
tcgtgtctgc tgcctctcc ttgg 84

<210> 131

<211> 426

<212> DNA

<213> Homo sapiens

<400> 131

atgtccttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttctctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggaaaagg agctccaagg 360
agaggacagc agacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 132

<211> 141

<212> PRT

<213> Homo sapiens

<400> 132

Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110

Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Gln Thr Arg Arg Lys
115 120 125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 133

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 133

gcggcacatg tcttacaacc acctgcaggg tg

32

<210> 134

<211> 93

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 134

ctgcccagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttcct 60
tcgtgttttc tgccttccc ttggagctcc ttt 93

<210> 135

<211> 426

<212> DNA

<213> Homo sapiens

<400> 135

atgtcttaca accacctgca ggggtgacgtt cggtggcgta aactgttctc tttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggaaaagg agctccaagg 360
gaaggacaga aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 136

<211> 140

<212> PRT

<213> Homo sapiens

<400> 136

Met Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser
1 5 10 15
Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly
20 25 30
Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val
35 40 45
Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu
50 55 60
Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn
65 70 75 80
Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr
85 90 95
Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu
100 105 110

Asn Gly Lys Gly Ala Pro Arg Glu Gly Gln Lys Thr Arg Arg Lys Asn
 115 120 125

Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
 130 135 140

<210> 137
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 137
 gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 138
 <211> 93
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 138
 ctgcccgaagc ttttatgagt gtaccacccat tggaagaaag tgagcagagg tgtttttcct 60
 tctgtgttttc tgtccctgcc ttggagctcc ttt 93

<210> 139
 <211> 426
 <212> DNA
 <213> Homo sapiens

<400> 139
 atgtcttaca accacctgca ggggtgacgtt cggtggcgta aactgttctc tttcaccaaa 60
 tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
 tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
 agcaactatt acttagccat gaacaagaag gggaaactct atggctcaa agaatttaac 240
 aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
 aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agtccaagg 360
 caggacaga aaacacgaag gaaaaacacc tctgtctact ttcttccaat ggtggtacac 420
 tcatag 426

<210> 140
 <211> 141
 <212> PRT
 <213> Homo sapiens

<400> 140
 Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
 1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
 20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
 35 40 45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Gln Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 141
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 141
gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 142
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 142
ttgaatggag aaggagctcc a 21

<210> 143
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 143
tggagctcct tctccattca a 21

<210> 144
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 144
ctgcccaagc ttttatgagt gtaccaccat tgg 33

<210> 145
<211> 426
<212> DNA
<213> Homo sapiens

<400> 145
atgtcttaca accacctgca ggggtgacgtt cggtggcgta aactgttctc tttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcatacatt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggagaagg agtccaagg 360
agaggacaga aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 146
<211> 141
<212> PRT
<213> Homo sapiens

<400> 146
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15
Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30
Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45
Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Glu Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 147
<211> 3974
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: pHE4-5 vector

<400> 147

ggtacctaag	tgagtagggc	gtccgatcga	cggacgcctt	ttttttgaat	tcgtaatcat	60
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ccggaagcat	aaagtgtaaa	gcctgggggtg	cctaattgagt	gagctaactc	acattaattg	180
cgttgcgctc	actgcccgtc	ttccagtcgg	gaaacctgtc	gtgccagctg	cattaatgaa	240
tcggccaacg	cgcggggaga	ggcggtttgc	gtattgggcg	ctcttcgctc	tcctcgctca	300
ctgactcgct	gcgctcggtc	gttcggctgc	ggcgagcggt	atcagctcac	tcaaaggcgg	360
taatacgggt	atccacagaa	tcaggggata	acgcaggaaa	gaacatgtga	gcaaaaggcc	420
agcaaaaggc	caggaaccgt	aaaaaggccg	cgttgctggc	gtttttccat	aggctccgcc	480
cccctgacga	gcatacaaaa	aatcgacgct	caagtacagag	gtggcgaaac	ccgacaggac	540
tataaagata	ccaggcgttt	ccccctggaa	gctccctcgt	gcgctctcct	gttcgacccc	600
tgccgcttac	cggatacctg	tccgcctttc	tcccttcggg	aagcgtggcg	ctttctcata	660
gctcacgctg	taggtatctc	agttcgggtg	aggtcgttcg	ctccaagctg	ggctgtgtgc	720
acgaaccccc	cgttcagccc	gaccgctgcg	ccttatccgg	taactatcgt	cttgagtcca	780
acccggtaag	acacgactta	tcgccactgg	cagcagccac	tggtaacagg	attagcagag	840
cgaggtagtg	aggcgggtgt	acagagttct	tgaagtgggt	gcctaactac	ggctacacta	900
gaagaacagt	atttggatat	tgcgctctgc	tgaagccagt	taccttcgga	aaaagagttg	960
gtagctcttg	atccggcaaa	caaaccaccg	ctggtagcgg	tggttttttt	gtttgcaagc	1020
agcagattac	gcgcagaaaa	aaaggatctc	aagaagatcc	tttgatcttt	tctacggggg	1080
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acctttcgcg	gtatggcatg	atagcgcccg	gaagagagtc	aattcagggt	ggtgaatgtg	1260
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atcgcgctgt	tagcggggcc	attaagttct	gtctcggcgc	gtctgcgtct	ggctggctgg	1860
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gccatgtccg	gttttcaaca	aaccatgcaa	atgctgaatg	agggcatcgt	tcccactgcg	1980
atgctgggtg	ccaacgatca	gatggcgctg	ggcgcaatgc	gcgccattac	cgagtcgggg	2040
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ggcggcggtg	gaatcgaaat	ctcgtgatgg	caggttgggc	gtcgcttggt	cggtcatttc	2700
gaaccccgag	gtcccgtcga	gaagaactcg	tcaagaaggc	gatagaaggc	gatgcgctgc	2760
gaatcggggg	cggcgatacc	gtaaagcacg	aggaagcggg	cagcccatte	gccgccaagc	2820
tcttcagcaa	tatcacgggt	agccaacgct	atgtcctgat	agcgggtccg	cacacccagc	2880
cggccacagt	cgtgaatcc	agaaaagcgg	ccattttcca	ccatgatatt	cggcaagcag	2940
gcacgcgcat	gggtcacgac	gagatcctcg	ccgtcgggca	tgcgcgcttc	gagcctggcg	3000
aacagttcgg	ctggcgcgag	cccctgatgc	tcttcgtcca	gatcatcctg	atcgacaaga	3060
cgggcttcca	tccgagtagc	tgctcgctcg	atgcgatgtt	tcgcttggtg	gtcgaatggg	3120
caggtagccg	gatcaagcgt	atgcagccgc	cgcattgcat	cagccatgat	ggatactttc	3180
tcggcaggag	caaggtgaga	tgacaggaga	tccctccccg	gcacttcgcc	caatagcagc	3240
cagtcctctc	ccgcttcagt	gacaacgtcg	agcacagctg	cgcaaggaaac	gcccgtcgtg	3300
gccagccacg	atagccgcgc	tgccctcgcc	tgcatgttcat	tcagggcacc	ggacagggtcg	3360
gtcttgacaa	aaagaaccgg	gcgcccctgc	gctgacagcc	ggaacacggc	ggcatcagag	3420
cagccgattg	tctgttgtgc	ccagtcatag	ccgaatagcc	tctccaccca	agcggccgga	3480
gaacctgcgt	gcaatccatc	ttgttcaatc	atgcgaaacg	atcctcatcc	tgtctcttga	3540
tcagatcttg	atccccctgc	ccatcagatc	cttggcggca	agaaagccat	ccagtttact	3600
ttgcagggct	tcccaacctt	accagagggc	gccccagctg	gcaattccgg	ttcgcttgct	3660

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gtccataaaa cgcgccagtc tagctatcgc catgtaagcc cactgcaagc tacctgcttt 3720
ctctttgcgc ttgcgttttc ccttggtccag atagcccagt agctgacatt catccggggg 3780
cagcaccggt tctgcggact ggctttctac gtgttccgct tccttttagca gcccttgccg 3840
cctgagtgtc tgcggcagcg tgaagcttaa aaaactgcaa aaaatagttt gacttggtgag 3900
cggataacaa ttaagatgta cccaattgtg agcggataac aatttcacac attaaagagg 3960
agaaattaca tatg 3974
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<210> 148
 <211> 112
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: pHE4-5
 promoter sequence

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<400> 148
aagcttaaaa aactgcaaaa aatagtttga cttgtgagcg gataacaatt aagatgtacc 60
caattgtgag cggataacaa tttcacacat taaagaggag aaattacata tg 112
```

<210> 149
 <211> 106
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

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<400> 149
gagcgcggat cgcgccacat gaaggtctcc gtggctgccc tctcctgcct catgcttggt 60
actgcccttg gatctcaggc cagctacaat caccttcaag gagatg 106
```

<210> 150
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

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<400> 150
gagcgcggat ccctatgagt gtaccacat tggaag 36
```

<210> 151
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

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<400> 151
ccggccatat gcgtaaactg ttctctttca cc 32
```

<210> 152
 <211> 35
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 152

ccggcggtac cttattatga gtgtaccacc attgg

35

<210> 153

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 153

gatcgccata tggctggtcg tcacgttcgt tc

32

<210> 154

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 154

gatcgcggtgta cttattatg agtgtaccac cattggaag

39

<210> 155

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 155

gatcgccata tggctggtcg tcacgttcgt tc

32

<210> 156

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 156

gatcgcggtgta cttattatg agtgtaccac cattggaag

39

<210> 157

<211> 32

<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 157
gatcgccata tggctggtcg tcacgttcgt tc 32

<210> 158
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 158
gatcgcggtg ccttattatg agtgtaccac cattggaag 39

<210> 159
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 159
gatcgccata tggctggtcg tcacgttcgt tc 32

<210> 160
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 160
gatcgcggtg ccttattatg agtgtaccac cattggaag 39

<210> 161
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 161
gatcgcggtg cgcaccat gtggaaatgg atactgacac attgtgc 47

<210> 162
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 162
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 163
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 163
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 164
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 164
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 165
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 165
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 166
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 166
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 167
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 167
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 168
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 168
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 169
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 169
gatcgccata tggctggtcg tcacgttcgt tc 32

<210> 170
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 170
gatcgcggtta ccttattatg agtgtaccac cattggaag 39

<210> 171
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 171
gatcgccata tggctggtcg tcacgttcgt tc 32

<210> 172
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 172
gatcgcggtta ccttattatg agtgtaccac cattggaag 39

<210> 173

<211> 456
<212> DNA
<213> Escherichia coli

<400> 173
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aaactgttct ctttcaccaa atacttcctg aaaatcgaaa aaaacggtaa agtttctggg 120
accaagaagg agaactgccc gtacagcatc ctggagataa catcagtaga aatcggagtt 180
gttgccgtca aagccattaa cagcaactat tacttagcca tgaacaagaa ggggaaactc 240
tatggctcaa aagaatttaa caatgactgt aagctgaagg agaggataga ggaaaatgga 300
tacaatacct atgcatcatt taactggcag cataatggga ggcaaatgta tgtggcattg 360
aatggaaaag gagctccaag gagaggacag aaaacacgaa ggaaaaacac ctctgctcac 420
tttcttccaa tgggtgtaca ctcataataa ggtacc 456

<210> 174
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 174
gactacatat ggctggctgt cacgttcgtt cttacaacca cctgcagg 48

<210> 175
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 175
ctagtctcta gattattatg agtgtacaac catcggcagg aagtgag 47

<210> 176
<211> 447
<212> DNA
<213> Escherichia coli

<400> 176
atggctggtc gtcacgttcg ttcttacaac cacctgcagg gtgacgttcg ttggcgtaaa 60
ctgttctctt tcaccaaata cttcctgaaa atcgaaaaga acggtaaaag ttctggtacc 120
aagaaagaaa actgcccgtg ctctatcctg gaaatcacct ccgttgaaat cgggtgttgta 180
gccgttaaag ccatcaactc caactattac ctggccatga acaaaaaggg taaactgtac 240
ggctctaaag aattcaacaa cgactgcaaa ctgaaagaac gtatcgaaga gaacggttac 300
aacacctacg catccttcaa ctggcagcac aacggtcgtc agatgtacgt tgcactgaac 360
ggtaaaggcg ctccgcgtcg cggtcagaaa acccgtcgca aaaacacctc tgctcacttc 420
ctgccgatgg ttgtacactc ataataa 447